

WHAT IS CLAIMED IS:

1. A method of estimating information about a target based on data from a plurality of flight passes, the method comprising:

determining first information from a first flight pass of an antenna pair;

5 determining second information from a second flight pass of an antenna pair;

using the first and second information to estimate an antenna baseline length between the first and second flight passes; and

estimating one of a ground range position and height of the target based on the antenna baseline length.

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2. The method of Claim 1, wherein each of said determining steps includes producing for the corresponding flight pass range and phase measurements relative to a reference point.

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3. The method of Claim 2, wherein each said producing step includes producing the range and phase measurements relative to a predetermined point spatially associated with the corresponding antenna pair.

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4. The method of Claim 3, wherein said using step includes, for each antenna pair, using the range and phase measurements to determine a distance from the reference

point to a groundpoint beneath the predetermined point wherein an approximately straight line drawn from the groundpoint to the predetermined point forms approximately a right angle with a horizontal plane containing the reference point.

5 5. The method of Claim 3, wherein said using step includes, for each antenna pair, using the range and phase measurements to determine a distance from the predetermined point to a groundpoint beneath the predetermined point wherein an approximately straight line drawn from the groundpoint to the predetermined point forms approximately a right angle with a horizontal plane containing the reference point.

10 6. The method of Claim 3, wherein the predetermined point is a midpoint between the corresponding antenna pair.

15 7. The method of Claim 1, wherein said using step includes using the first and second information to produce respective first and second sets of ground range and height information.

 8. The method of Claim 7, wherein said using step includes calculating a difference between the ground range information of said sets and a difference between the

height information of said sets, squaring each of the differences, adding the squared differences, and taking the square root of the sum of the squared differences.

9. The method of Claim 7, wherein said using step includes providing each set
5 of ground range information and height information measured relative to a reference point and a predetermined point spatially associated with the corresponding antenna pair.

10. The method of Claim 1, wherein said estimating step includes using the
baseline length to calculate an antenna angle formed between a line from a reference point to
10 a predetermined point spatially associated with one of the antenna pairs and a line from the predetermined point to the target.

11. The method of Claim 10, wherein said estimating step includes determining a
sign of the antenna angle.

12. The method of Claim 11, wherein the sign of the antenna angle is positive
when the reference point is located horizontally between the predetermined point and the
target.

13. The method of Claim 11, wherein the sign of the antenna angle is negative when the target is located horizontally between the reference point and the predetermined point.

5 14. The method of Claim 11, wherein said estimating step includes estimating one of the ground range position and the height of the target based on the sign of the antenna angle.

10 15. The method of Claim 1, wherein both determining steps use the same antenna pair.

16. The method of Claim 1, wherein said estimating step includes estimating both the ground range position and the height of the target based on the antenna baseline length.

15 17. An apparatus for estimating information about a target based on data from a plurality of flight passes, the apparatus comprising:

an input for receiving first information determined from a first flight pass of an antenna pair, and second information determined from a second flight pass of an antenna pair;

a distance estimator coupled to said input and responsive to said first and second information for estimating an antenna baseline length between the first and second flight passes; and

a target information estimator coupled to said distance estimator for estimating one of
5 a ground range position and height of the target based on the antenna baseline length estimate.

18. The apparatus of Claim 17, wherein said distance estimator includes a ground range estimator for producing a ground range estimate and a height estimator for producing a
10 height estimate.

19. The apparatus of Claim 17, wherein said target information estimator includes an antenna angle estimator for determining an antenna angle and a sign of the antenna angle.

15 20. The apparatus of Claim 19, wherein the sign of the antenna angle is positive when a reference point is located horizontally between a predetermined point spatially associated with the corresponding antenna pair and the target and negative when the target is between the reference point and the predetermined point.

21. The apparatus of Claim 19, wherein said target information estimator includes both a ground range position estimator for producing the ground range position of the target and a height estimator for producing the height of the target.

5 22. The apparatus of Claim 21, wherein said height estimator is for producing first and second height estimates and said ground range position estimator is for producing first and second ground range estimates, said target information estimator including a selector coupled to said antenna angle estimator, said ground range position estimator, and said height estimator for selecting one of the first and second ground range position estimates
10 and one of the first and second height estimates based on the sign of the antenna angle.